

METHODS AND APPARATUS FOR INTERFACING  
TO A DATA STORAGE SYSTEM

ABSTRACT OF THE DISCLOSURE

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A data storage system includes methods and apparatus that provide volumes for access by host computing devices. The volumes can have a storage size that is independently configurable from an actual amount of data storage that may or may not be associated with the volume. The volumes also have a persistent identifier. The volumes can have any amount of associated storage space allocated to the volume, including none, within the data storage system. Since the storage size and associated storage space are each independently configurable from each other, host that interface with the data storage system can perceive the volumes as being larger than they really are. A dynamic volume configuration technique is provided which allows storage space within storage devices in the data storage system to be dynamically associated and disassociated (i.e., added and removed) from the volumes on an as-needed basis, without requiring disruption of host activities with respect to the volumes. The persistent identifier of a volume allows all hosts and other data storage systems to "see" the volume. This allows a volume in one data storage system to have associated storage space from another volume in another data storage system. Using these techniques, the invention allows software applications and operating systems on hosts that interface to the data storage system to perceive that a volume is always present on the data storage system, even if storage space understood to be associated with the volume from the host's perspective is allocated elsewhere or is non-existent.